Bangalore Electricity Supply Company Limited
(Wholly owned by Government of Karnataka Undertaking)

BOQ for Expanding DAS to District headquarters, Peri-urban & Industrial areas across BESCOM

Sl. No.	Description	Unit	Qty	Amount
Part A: Design, Suppy, Install and Commission SCADA field devices in District Headquarters, Peri-Urban area of Bengaluru city and Industrial areas across BESCOM jurisdiction.				
1	DAS Specification Compact 3 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 1VL (One Incomer + One Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	157	
2	DAS Specification Compact 4 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 2VL (One Incomer + Two Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	172	
3	DAS Specification Compact 5 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 3VL (One Incomer + Three Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	237	
4	Single Panel Breaker Type RMU with Incoming and Outgoing including accessories for DAS and RTU hosting	**Unit**	282	
5	**Supply** :11 kV, 630 Amps, 12.5 KA Auto reclosures (LRC) with control pannel including necessary hardware structure protection system etc., as per specification **Labour**: Erection of 11 kV Auto reclosures with control box GSM modem, connecting cable, control transformer, wiring testing and commissioning including parameterisation.	**Set**	499	
6	**Supply :**11 kV, 12.5 KA Sectionalizer (LBS) with control box having control logic with necessary hardware etc., **Labour:** Erection of 11 kV sectionalizers with control box, connecting cable, PTs wiring testing and commissioning including parameterisation.	**Set**	328	
7	11 kV, 3x400 Sqmm XLPE UG Cable	**KM**	36.39	
8	11 kV, 3x240 Sqmm XLPE UG Cable	**KM**	6.03	
9	11 kV, 3x95 Sqmm XLPE UG Cable	**KM**	23.28	
10	Straight Through Jointing Kits HS Type suitable for 3x400 Sqmm Cable	**No**	1688	
11	Cable Termination Kit Outdoor HS Type Suitable for 3x400 Sqmm Cable	**Per kit**	85	
12	Cable Termination Kit Indoor HS Type Suitable for 3x400 Sqmm Cable	**Per kit**	1688	
13	Straight Through Jointing Kits HS Type suitable for 3x240 Sqmm Cable	**No**	129	
14	Cable Termination Kit Outdoor HS Type Suitable for 3x240 Sqmm Cable	**Per kit**	26	
15	Cable Termination Kit Indoor HS Type Suitable for 3x240 Sqmm Cable	**Per kit**	129	
16	Straight Through Jointing Kits HS Type suitable for 95 Sqmm Cable	**No**	1091	
17	Cable Termination Kit Outdoor HS Type Suitable for 95 Sqmm Cable	**Per Kit**	218	
18	Cable Termination Kit Indoor HS Type Suitable for 95 Sqmm Cable,	**Per Kit**	1091	
19	Supplying of Frame of MS Channel 100x50mm and MS angle 40x40x5 mm welding etc., complete	**Kg**	41349.73	
20	Earth Excavation for RMU Foundation depositing of earth on bank up to a lead of 50 Mtr and with a lift up to 1.5 Mtr	**CMT**	3765.41	
21	Bed Concreting with CC 1:2:4 [M-15] Using 20mm Nominal size graded crushed coarse aggregates	**CMT**	432.57	
22	Foundation with CC 1:2:4 [M-15] Using 20mm Nominal size graded crushed coarse aggregates	**CMT**	1113.01	
23	Providing Reinforecement TMT Fe 550/550D	**Kg**	50098.7	

Sl. No.	Description	Unit	Qty	Amount
24	Lettering the RMU with enamel paint and also writing single line diagram of each panel, caution Board, Danger Board etc., including cost of Paint, Brush etc.,	**per panel**	848	
25	Providing chain link fencing 50 mm size of 8 guage properly stretched between rectangular Poles and fixed with suitable bolts & nuts, the free ends shall be welded to the Pole and block pipe at top and bottom as required including cost of all materials, labour, lead and lifts, cutting, bending wherever necessary, wastage and lapping etc., complete as per the direction of the engineer incharge for work including two coats of approved quality paint over one coat of primer paint.	**Sqmtr**	10176	
26	Transportation 1 panel (Compact) unit from store to work spot including loading, Unloading (No separate crane charges)	**No**	1675	
27	GI Pipe, 100 mm Dia for drain crossing, cable raising etc., (Extracted from Vol-5, BWSSB SR Item No. 177)	**Mtr**	986.00	
28	GI/Copper strips for grounding connections,using necessary fixing materials as required 25 x 3 mm (GI strip Material) Sl No: 12.58.2	**Mtr**	12405	
29	40 x 6 mm GI/Copper strips for grounding connections, using necessary fixing materials as required (GI strip Material) Sl. No. 12.58.4	**Mtr**	2544.00	
30	Rod type of earthing using 40 mm Dia, 3 Mtr long MS rod as ground rod, in earth pit of 300 mm width and 3300 mm depth and using 50x6 mm flat welded to ground rod as terminal & connected to equipment ground terminal using PVC Al wire as specified	**No**	3350	
31	Bentonite clay slurry for earthing in 50 Kg Bag	**Bag**	3350	
32	Route and Joint Indicating Stones	**No**	1183	
33	Cable covering tiles 250x125x40 mm or 125x125x40 mm	**Per 1000**	236.52	
34	Artificial/Manufacture Sand(Extracted from Vol-1, PWD SR Sl No. 62)	**Cmt**	3547.80	
35	Cable trench excavation, 1000x0.6x1=600, Ordinary soil (Extracted from Vol-1, PWD SR Sl No. 1.17.1)	**Cmt**	35478.00	
36	11 kV, 230V, 2 Phase, 300 VA control transformer for providing auxillary power (AT).	**Set**	827	
37	9.6 kV, 200 Amps long duration porcelain housed Surge arrestors	**Each**	4962	
38	Fabrication & supply & errection of structrual steel including painting etc.	**No.**	827	
39	Pre-Stressed Tubular Spun Pole - 11 Mtr Long, 500 Kg WL (Dwg No. BESCOM/GM/QS&S/45 Dtd 24.11.2018)	**No**	827	
40	Single H Frame without Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole for 63/100/250/500 kVA (OH Line) - MS (Dwg No. BESCOM/GM/QS&S/68 Dtd 24.11.2018)	**No**	827	
41	HT Single Top Support with bolts, nuts & washers	**Set**	827	
42	Concreting materials for 11mtrs Spun Pole,			
	a) Base concreting 1:2:4, 1000x1000x150 mm	**Each**	827	
	b) Pole concreting 1:2:4, 1000x1000xx2500mm	**Each**	827	
	c) Coping 1:2:4 (as per actuals)	**Each**	827	
43	11 kV, 400 Amps Double Break GOS (Dwg No. BESCOM/GM/QS&S/22 Dtd 24.11.2018)	**Set**	50	
44	11 kV, 200 Amps Single Break GOS (Dwg No. BESCOM/GM/QS&S/22 Dtd 24.11.2018)	**Set**	33	
45	DP Structure using PSCC Pole - 9 Mtr Long, 300 Kg WL	**Set**	25	
46	H-Frame for mounting GOS	**No**	25	
47	11 kV, special 3 pin Cross Arm - Galvanised Iron (GI)	**No**	827	
48	11 kV, 45 KN Polymeric Insulator	**No**	4962	

Sl. No.	Description	Unit	Qty	Amount
49	Coyote ACSR Conductor	**KM**	9.98	
50	Rabbit ACSR Conductor	**km**	6.56	
51	Guy Set Complete with No. 15 Strain Insulator	**Set**	25	
52	Guy concreting with Boulders, Mud and Sand	**No**	25	
53	Caution/Danger Board	**No**	1675	
54	Anti Climbing Device (12 Mtr GI Barbed Wire)	**Each**	827	
55	PG Clamps for Coyote Conductor (C to C)	**No**	2994	
56	PG Clamps for Rabbit Conductor (C to R)	**No**	1968	
57	185 Sqmm Copper Terminal, Apprx Wt: 158 Gm	**No**	496	
58	Horizontal Cross Arm	**No**	827	
59	1.1 KV Class HR (Heat Resistant) PVC Insulated & UnSheathed Aluminium Wires Multistrand Single Core Lead wires as per IS-694: 2010,PVC Wire - 16 Sqmm Al Wt: 4.2 Kg, Total Wt: 7.5 Kg/100 Mtr Coil	**Coil**	33	
60	16 Sqmm Aluminium End Terminal (Lug)	**No**	1654	
61	Employer Proto type inspection(Stage by Stage:3 Stages) expenses covering 2 batches each(each stage consists of 2 to 3 persons), inclusive of travel and accommodation for SPB, RMUs at manufacturing facility	**No**	lump sum	
62	Employer Proto type inspection(Stage by Stage:3 Stages) expenses covering 1 batch(each stage consists of 2 to 3 persons), inclusive of travel and accommodation for LRC & LBS at manufacturing facility	**No**	lump sum	
63	Employer Training expenses covering 13 batches, each comprising 8 participants for a duration of 5 days inclusive of course material, travel and accommodation for SPB, RMUs & RTU at manufacturing facility	**No**	lump sum	
64	Employer Training expenses covering 3 batches, each comprising 5 participants for a duration of 10 days inclusive of course material, travel and accommodation for LRC & LBS at manufacturing facility	**No**	lump sum	
65	Employer Project Management expenses for 2 batches compraising of 3 personnel includes travel and accommodation for LRC & LBS at manufacturing facility	**No**	lump sum	
66	Employer expenses for 4 batches compraising of 3 personnel attending FAT includes travel and accommodation for LRC & LBS at manufacturing facility	**No**	lump sum	
67	Employer Training(Classroom & Field) expenses covering 25 batches, each comprising 25 participants for a duration of 2 days inclusive of course material, travel and accommodation for LRC, LBS, SPB, RMUs & RTU at Project area	**No**	lump sum	
68	Specialized training(Classroom & Field) expenses covering 4 batches, each comprising 10 participants for a duration of 10 days for Engineers, Switchgear Operators, Maintenance Technicians, Safety Officers, Supervisors, Testing and commissioning team inclusive of course material, travel and accommodation for LRC, LBS, SPB, RMUs & RTU at Project area	**No**	lump sum	
69	Employer Project Management expenses for 4 batches compraising of 3 personnel includes travel and accommodation for SPB & RMU at manufacturing facility	**No**	lump sum	
70	Employer expenses for 8 batches compraising of 2 personnel attending FAT includes travel and accommodation for SPB and RMU at manufacturing facility	**No**	lump sum	

Sl. No.	Description	Unit	Qty	Amount
71	Relay Testing Equipments for 11kV RMU System: 3-Phase Current Injection Test Kit (Secondary Injection), Primary Current Injection Test Kit, Relay Test Set - Advanced(3phase), Insulation Resistance Tester (5kV), Digital Multimeter (True RMS), Earth Resistance Tester (3-Terminal), CT/PT Analyzer, High Voltage Test Kit (up to 28kV), Power Quality Analyzer, Circuit Breaker Timer, Contact Resistance Tester, Phase Sequence Indicator, Clamp Meter (1000A AC/DC), Digital Storage Oscilloscope (100MHz), Burden Test Kit, Laptop with Testing Software, Test Lead Set (Heavy Duty), Safety Equipment Kit 11kV rated(Gloves, Insulating mats, Safety cones, Warning signs, First aid kit, Arc flash PPE), Calibration Standards & Accessories.	**Set**	Each testing kit 6Nos	
72	Laptop with latest model	**No**	20	
Considering 10% of 11kV Network Growth for future two years				
73	DAS Specification Compact 3 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 1VL (One Incomer + One Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	16	
74	DAS Specification Compact 4 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 2VL (One Incomer + Two Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	17	
75	DAS Specification Compact 5 Way RMU (VCB/SF6 Type) as per IEC-62271 , 2OD + 3VL (One Incomer + Three Breakers + One Outgoing) 630 Amps with Copper Busbar	**Unit**	24	
76	Single Panel Breaker Type RMU with Incoming and Outgoing including accessories for DAS and RTU hosting	**Unit**	28	
77	**Supply** :11 kV, 630 Amps, 12.5 KA Auto reclosures (LRC) with control pannel including necessary hardware structure protection system etc., as per specification **Labour**: Erection of 11 kV Auto reclosures with control box GSM modem, connecting cable, control transformer, wiring testing and commissioning including parameterisation.	**Set**	50	
78	**Supply :**11 kV, 12.5 KA Sectionalizer (LBS) with control box having control logic with necessary hardware etc., **Labour:** Erection of 11 kV sectionalizers with control box, connecting cable, PTs wiring testing and commissioning including parameterisation.	**Set**	33	
79	11 kV, 3x400 Sqmm XLPE UG Cable	**KM**	2.55	
80	11 kV, 3x95 Sqmm XLPE UG Cable,	**KM**	1.22	
81	Straight Through Jointing Kits HS Type suitable for 3x400 Sqmm Cable	**No**	170	
82	Cable Termination Kit Outdoor HS Type Suitable for 3x400 Sqmm Cable	**Per kit**	9	
83	Cable Termination Kit Indoor HS Type Suitable for 3x400 Sqmm Cable	**Per kit**	170	
84	Straight Through Jointing Kits HS Type suitable for 95 Sqmm Cable	**No**	122	
85	Cable Termination Kit Outdoor HS Type Suitable for 95 Sqmm Cable	**Per Kit**	24	
86	Cable Termination Kit Indoor HS Type Suitable for 95 Sqmm Cable,	**Per Kit**	122	
87	Supplying of Frame of MS Channel 100x50mm and MS angle 40x40x5 mm welding etc., complete	**Kg**	4146.33	
88	Earth Excavation for RMU Foundation depositing of earth on bank up to a lead of 50 Mtr and with a lift up to 1.5 Mtr	**CMT**	378.42	
89	Bed Concreting with CC 1:2:4 [M-15] Using 20mm Nominal size graded crushed coarse aggregates	**CMT**	43.47	
90	Foundation with CC 1:2:4 [M-15] Using 20mm Nominal size graded crushed coarse aggregates	**CMT**	111.69	

Sl. No.	Description	Unit	Qty	Amount
91	Providing Reinforecement TMT Fe 550/550D	**Kg**	5029.8	
92	Lettering the RMU with enamel paint and also writing single line diagram of each panel, caution Board, Danger Board etc., including cost of Paint, Brush etc.,	**per panel**	85	
93	Providing chain link fencing 50 mm size of 8 guage properly stretched between rectangular Poles and fixed with suitable bolts & nuts, the free ends shall be welded to the Pole and block pipe at top and bottom as required including cost of all materials, labour, lead and lifts, cutting, bending wherever necessary, wastage and lapping etc., complete as per the direction of the engineer incharge for work including two coats of approved quality paint over one coat of primer paint.	**Sqmtr**	1020.00	
94	Transportation 1 panel (Compact) unit from store to work spot including loading, Unloading (No separate crane charges)	**No**	168	
95	GI Pipe, 100 mm Dia for drain crossing, cable raising etc., (Extracted from Vol-5, BWSSB SR Item No. 177)	**Mtr**	99	
96	GI/Copper strips for grounding connections,using necessary fixing materials as required 25 x 3 mm (GI strip Material) Sl No: 12.58.2	**Mtr**	1245	
97	40 x 6 mm GI/Copper strips for grounding connections, using necessary fixing materials as required (GI strip Material) Sl. No. 12.58.4	**Mtr**	255	
98	Rod type of earthing using 40 mm Dia, 3 Mtr long MS rod as ground rod, in earth pit of 300 mm width and 3300 mm depth and using 50x6 mm flat welded to ground rod as terminal & connected to equipment ground terminal using PVC Al wire as specified	**No**	336	
99	Bentonite clay slurry for earthing in 50 Kg Bag	**Bag**	336	
100	Route and Joint Indicating Stones	**No**	68	
101	Cable covering tiles 250x125x40 mm or 125x125x40 mm	**Per 1000**	14	
102	Artificial/Manufacture Sand	**Cmt**	203.4	
103	Cable trench excavation, 1000x0.6x1=600, Ordinary soil (Extracted from Vol-1, PWD SR Sl No. 1.17.1)	**Cmt**	2034	
104	11 kV, 230V, 2 Phase, 300 VA control transformer for providing auxillary power (AT).	**Set**	83.00	
105	9.6 kV, 200 Amps long duration porcelain housed Surge arrestors	**Each**	498.00	
106	Fabrication & supply & errection of structrual steel including painting etc.	**No.**	83.00	
107	Pre-Stressed Tubular Spun Pole - 11 Mtr Long, 500 Kg WL (Dwg No. BESCOM/GM/QS&S/45 Dtd 24.11.2018)	**No**	83.00	
108	Single H Frame without Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole for 63/100/250/500 kVA (OH Line) - MS (Dwg No. BESCOM/GM/QS&S/68 Dtd 24.11.2018)	**No**	83.00	
109	HT Single Top Support with bolts, nuts & washers	**Set**	83.00	
110	Concreting materials for 11mtrs Spun Pole,			
	a) Base concreting 1:2:4, 1000x1000x150 mm	**Each**	83.00	
	b) Pole concreting 1:2:4, 1000x1000xx2500mm	**Each**	83.00	
	c) Coping 1:2:4 (as per actuals)	**Each**	83.00	
111	11 kV, 400 Amps Double Break GOS (Dwg No. BESCOM/GM/QS&S/22 Dtd 24.11.2018)	**Set**	5.00	
112	11 kV, 200 Amps Single Break GOS (Dwg No. BESCOM/GM/QS&S/22 Dtd 24.11.2018)	**Set**	3.00	
113	DP Structure using PSCC Pole - 9 Mtr Long, 300 Kg WL	**Set**	3.00	
114	H-Frame for mounting GOS	**No**	3.00	
115	11 kV, special 3 pin Cross Arm - Galvanised Iron (GI)	**No**	83.00	
116	11 kV, 45 KN Polymeric Insulator	**No**	498.00	

Sl. No.	Description	Unit	Qty	Amount
117	Coyote ACSR Conductor	**KM**	1.00	
118	Rabbit ACSR Conductor	**km**	0.66	
119	Guy Set Complete with No. 15 Strain Insulator	**Set**	3.00	
120	Guy concreting with Boulders, Mud and Sand	**No**	3.00	
121	Caution/Danger Board	**No**	168.00	
122	Anti Climbing Device (12 Mtr GI Barbed Wire)	**Each**	83.00	
123	PG Clamps for Coyote Conductor (C to C)	**No**	300.00	
124	PG Clamps for Rabbit Conductor (C to R)	**No**	198.00	
125	185 Sqmm Copper Terminal, Apprx Wt: 158 Gm	**No**	50.00	
126	Horizontal Cross Arm	**No**	83.00	
127	1.1 KV Class HR (Heat Resistant) PVC Insulated & UnSheathed Aluminium Wires Multistrand Single Core Lead wires as per IS-694: 2010,PVC Wire - 16 Sqmm Al Wt: 4.2 Kg, Total Wt: 7.5 Kg/100 Mtr Coil	**Coil**	3.32	
128	16 Sqmm Aluminium End Terminal (Lug)	**No**	166	
129	Bi-annual preventive maintenace and break down maintenance (2 years, 4 cycles)	**No**	7372	
130	Spares for Bi-annual preventive maintenace and break down maintenance (2 years, 4 cycles)			
131	Electrical Inspectorate and statutory charges lump sum		1843	
			Total A	**2107143696.00**
Part B: Design, Suppy, Install and Commission Remote Terminal Units for SCADA field devices installed in District Headquarters, Peri-Urban areas of Bengaluru city and Industrial areas across BESCOM jurisdiction.				
1	RTU (Remote Terminal Unit) Input Voltage: 16V DC to 32V DC Type: Isolated Un-Grounded type-Input ground and output ground are isolated from each other Output Voltage: 24V DC Fixed Output Current: 2.5 Amp`s Fixed RTU Software/Firmware: RTU have configuration and maintenance softwaretool. Compatible for existing DAS System)	No	566	
2	Installation, testing and commissioning of RMU - RTU	No	566	
3	Transportation and insurance	No	566	
4	RTU for Single Panel Breaker with firmware and functionalities/capabilities as described in the technical specification.	No	282	
5	Installation, testing and commissioning of SPB - RTU	No	282	
6	Transportation and insurance	No	282	
7	Test Sets with license key for integration testing between RMU, RTU and control centre as described in technical specifications.	No	8	
8	AMC for RTU for two years at 5% of hardware cost per year	Lot		
			Total B	**232046862.00**
Part C:Hardware/software required for administration of SCADA Devices installed in district headquaters, periurban areas of Bengaluru city and industrial areas acorss BESCOM jurisdiction at DAS control centres.				

Sl. No.	Description	Unit	Qty	Amount
1	Workstation with dual Monitors (Network monitoring) at BICC-1 Dell Precision 5820XL Tower XCTO Bas Intel Xeon Processor W-2223 (4C 3.6GHz 3.9 GHZ Turbo HT 8.25MB 120W DDR4-2666) NVIDIA RTX A 2000 12GB 4mDP to DP Integrated Intel AHCI SATA Chipset controller (8x 6.0Gb/s) SW RAID 0,1,5,10 64GB 4x16GB DDR4 2933MHz RDIMM ECC Memory 500GB SATA 7200 RPM Hard disk Dual Gigabit NIC card (PCIe Intel) SFP compatible Dell 24" monitor KEyboard and Mouse, Mouse pad Sound card and speakers Onsite/In-home service after remote diagnosis for five years Windows 11 Pro for workstation (up to 4 cores), English	No.	6	
2	Operations Department Interface console at BICC-1 Dell Precision 5820XL Tower XCTO Bas Intel Xeon Processor W-2223 (4C 3.6GHz 3.9 GHZ Turbo HT 8.25MB 120W DDR4-2666) NVIDIA RTX A 2000 12GB 4mDP to DP Integrated Intel AHCI SATA Chipset controller (8x 6.0Gb/s) SW RAID 0,1,5,10 64GB 4x16GB DDR4 2933MHz RDIMM ECC Memory 512GB SSD Hard Drive Dual Gigabit NIC card (PCIe Intel) SFP compatible Dell 24" monitor KEyboard and Mouse, Mouse pad Sound card and speakers Onsite/In-home service after remote diagnosis for five years Windows 11 Pro for workstation (up to 4 cores), English	No.	2	
3	Remote VDUs at Zonal and Circle offices Dell Precision 5820XL Tower XCTO Bas Intel Xeon Processor W-2223 (4C 3.6GHz 3.9 GHZ Turbo HT 8.25MB 120W DDR4-2666) NVIDIA RTX A 2000 12GB 4mDP to DP Integrated Intel AHCI SATA Chipset controller (8x 6.0Gb/s) SW RAID 0,1,5,10 64GB 4x16GB DDR4 2933MHz RDIMM ECC Memory 512GB SSD Hard Drive Dual Gigabit NIC card (PCIe Intel) SFP compatible Dell 24" monitor KEyboard and Mouse, Mouse pad Sound card and speakers Onsite/In-home service after remote diagnosis for five years Windows 11 Pro for workstation (up to 4 cores), English	No.	6	
4	Firewall /SD-WAN at Remote VDU location	No.	6	
5	Video Projection system including micro-LED video wall with 3x4 Module configuration with each module at least 67" diagonal size and a processor/server for video wall management at BICC-1	No.	1	
6	DAC Simulator Laptops Dell Make - Intel i7 Processor 32GB RAM 512GB SSD Hard Drive 15.4" Monitor Windows OS with five year support	No.	8	

Sl. No.	Description	Unit	Qty	Amount
7	SMS gateway - hardware, software and integration with DAS control centers to support atleast 20,000 SMS per month with five year support	No.	2	
8	Time, day & date digital display at BICC-1	Set	1	
9	Color multifunction printers supporting A3 and A4 with five year support	Set	2	
10	Black and White multifunction printers supporting A3 and A4 with five year support	Set	2	
11	Cables, ducts, trays and Installation Materials for Networking and Electrical cabling for each control center	Lot	2	
			Total C	**27743667.00**
			Total=A+B+C	**2366934225.00**